Table of Contents

Tables

Figures

Chapter Four – Airport Development Alternatives

The purpose of this chapter is to identify and evaluate alternative concepts for the long-term development of general aviation (GA) facilities at Lake Hood and ANC. The chapter discusses alternative ways to address the facility requirements analyzed in Chapter Three. The GA facility requirements were presented at a meeting of the Technical Advisory Committee (TAC) in October 2004, along with themes for alternative development of the Lake Hood complex.

The Anchorage Area General Aviation System Plan concluded that it was infeasible for Lake Hood to be expanded to accommodate the 20-year demand for floatplane activity. Accordingly, none of the four alternatives for Lake Hood fully meets all the facility needs identified in Chapter Three. Instead, the alternatives provide different levels of capacity. In contrast, there is enough undeveloped land west of South Airpark for the facilities needed for the higher performance GA aircraft that use the ANC airfield. The 2002 Ted Stevens Anchorage International Airport Master Plan Update identified this land for GA use.

The four alternatives proposed for Lake Hood are as follows:

- Alternative A – No Action
- Alternative B – Improvement without Expansion
- Alternative C – Slight Expansion
- Alternative D – More Expansion

The following sections describe these four alternatives, evaluate how well the Lake Hood alternatives meet the goals and objectives for this GA Plan, describe future taxiway development to expand lease land at South Airpark, and briefly analyze the environmental consequences of the potential development at Lake Hood.

4.1 Alternative A – No Action

No capital improvements would be constructed for this alternative, although the previously programmed Lakeshore Drive/Taxiway Separation Project east of Heliport Place at the south end of Lake Hood will be constructed in 2005 as planned. With Alternative A, Lake Hood would continue to be maintained and operated in its current configuration. Figure 4-1 shows Alternative A.

4.2 Alternative B – Improvement without Expansion

The focus of Alternative B is to fix safety, security, efficiency, and condition deficiencies rather than expand the capacity of aircraft parking. One of the key features of Alternative B is access control for all aircraft parking and operating areas in the Lake Hood complex. Aircraft areas would be fenced off from the public. Only leaseholders, tiedown and slip permit holders, and employees of the businesses inside the fence would have authorized access through electronically controlled gates. Figure 4-2 shows the major improvements that would be included in Alternative B.

4.2.1 Alternative B Airside

Airfield facilities would continue to be designed for and to serve visual operations by Airport Reference Code A-I aircraft of 12,500 pounds maximum takeoff weight.

Several improvements would enhance waterlane safety. As described in Chapter Three, the visibility zone between intersecting waterlanes is not clear. Alternative B would bring the visibility zone into compliance with the removal of four buildings at the tip of the Commercial Finger, four buildings east of the South Pothole, and Gull Island vegetation higher than 5 feet above the water surface. Three occupied buildings would be removed from the Waterlane SE and Waterlane E approach Runway Protection Zones (RPZs) to comply with FAA standards for RPZs. The NW Waterlane approach, which is seldom if ever used, would be eliminated from use in the Alaska Supplement to the Airport Facility Directory, to avoid the need to remove occupied buildings from the RPZ. A public ramp would be added at the South Pothole to facilitate the safe launch and recovery of floatplanes when there is a strong south wind. Waterlanes NW-SE and N-S would be marked and floodlit from the shore. A bank stabilization project would correct erosion around the shorelines of Lakes Hood and Spenard. FAA approval of the nonstandard length of the NW-SE and N-S waterlanes would be sought. Both waterlanes are less than the required 2,512 feet and less than 80 percent of the E-W waterlane length. The two waterlanes appear to provide adequate length for the floatplane operators using the waterlanes, however.

Figure 4-2 shows two options for bringing the RPZ at the north end of the gravel runway into compliance, so that off-airport residential areas would not be located within the RPZ.

- One option is to displace the north threshold by 350 feet so that the RPZ would be moved south and contained within airport property. To maintain the existing usable runway length, the runway would be extended southward 350 feet. The south threshold would be displaced 240 feet from the end of the runway so that the Runway Safety Area (RSA) and Object Free Area (OFA) would remain north of Lakeshore Drive and comply with FAA design standards. The gravel runway would be 2,550 feet long, with the following declared distances:

	Runway 13	Runway 31
Takeoff Run Available (TORA)	2,340'	2,200'
Takeoff Distance Available (TODA)	2,340'	2,200'
Landing Distance Available (LDA)	1,990'	2,200'
Accelerate-Stop Distance Available (ASDA)	2,340'	2,550'

- The second option, B-1, acquires 1.3 acres of land and seven duplexes on Wendy Way that are located within the existing RPZ. Two options for bringing the RPZ into compliance are presented so that the relative costs and impacts can be evaluated. The cost of acquiring the residences and relocating the residents is approximately $5.6 million at 2005 dollar values. If the residences were not relocated, they would need to be insulated as part of the Airport's noise compatibility program, the cost of which is approximately $880,000 at 2005 dollar values. Another $230,000 would need to be spent to lengthen the runway.

The south end of Runway 13-31's parallel taxiway would be paved, marked, and edge-lighted, and the taxiway OFA would be cleared of aircraft parking. The tiedown/taxilane configuration in the Lake Hood Strip parking apron would have to be reconfigured to minimize the loss of aircraft parking and to clear both the parallel taxiway OFA and the Lakeshore Drive taxilane OFA. The apron would be paved and marked when it is reconfigured.

Taxiway Victor would continue to link Lake Hood to the ANC airfield, although gates for aircraft would be added on both sides of Postmark Drive to prevent unauthorized access to the aircraft operating areas.

A taxiway/taxilane study would be conducted to determine detailed taxiway and taxilane needs. Probable recommendations of the study are that taxiways should be given letter designations according to FAA guidance, taxiways and taxilanes should be marked and provided directional signs, and taxilane OFA improvements should be made. Gravel-surfaced road/taxilane surfaces should be paved so that they can be marked clearly. The shared road/taxilane surfaces do not provide the 79-foot OFA required for an Airplane Design Group I taxilane, particularly at the fingers. The Airport would seek FAA approval of a modification of the standard, remove structures from the OFA, and/or set wingspan limits for aircraft based on the finger, based upon the clearance available and the wingspans of aircraft based on each finger.

4.2.2 Alternative B Landside

Alternative B would include aircraft parking improvements, although it would not expand aircraft parking. Slips in the northeast portion of Spenard Lake would be designated for transient floatplanes. Alternative B would expand Echo Parking northeastward to provide 29 paved

tiedowns to replace spaces lost to other improvements, such as a new public ramp, new perimeter road and fencing, and parallel taxiway OFA improvement. The new paved apron would be approximately 100,000 square feet in area. Fourteen tiedowns would be lost to clearing the parallel taxiway OFA at the Lake Hood Strip parking apron. A total of 15 floatplane slips would be lost. Four slips would be lost to the new South Ramp and area adjacent to the ramp needed for temporary parking and maneuvering. Eleven slips would be lost at the southeast side of Spenard Lake where there is insufficient room to provide road access to the slips inside the new fence that would be added along Aviation Avenue. (At the north end of Spenard Lake, four slips would be lost where a road inside the perimeter fence is needed, but four replacement slips would be added just west of Spenard Beach.)

Two areas would be made available for aviation related businesses to lease land and develop facilities such as for a Fixed Base Operator (FBO), an air taxi business, an aircraft maintenance business, hangars to lease or sell, or aircraft tiedowns to lease. One lease area would be 4.7 acres along Aircraft Drive east of Echo Parking. The other would be 7.6 acres north of the Field Maintenance Complex and southwest of Echo Parking. The 12.3 acres of these two new lease areas would be approximately the same area as the tenant development lost to RVZ and RPZ clearing. The new areas provide a place for tenant relocation, although they do not provide direct lake access. The land east of Echo Parking has separate taxiway and road access along the north and south sides, but lot depth is limited to 250 feet. Deeper lots could be developed southwest of Echo Parking. To make this land developable, the road on the east side would be relocated to the west side of the property, so that a taxilane abutting Echo Parking can be established on the east side.

A 5.7-acre site would be reserved east of the ADOT&PF office building, along International Airport Road, to lease to a single entity for a special development. This lot would be for an aviation-compatible use that would generate revenue for Lake Hood, would not need taxiway access, and would need the easy and direct public access that the location would provide.

Between this special lease lot and the ADOT&PF office building, a small GA terminal would be built. Air taxi customers and others would need to wait outside the fence and be picked up by the air taxi operator or another authorized person, since access to Lake Hood would be restricted. The terminal building would be approximately 2,500 square feet in area and would provide waiting area for up to 50 people, restrooms, and area for pay phones, vending machines, tourist brochures, and phones connecting to individual businesses. The terminal should have a parking area for about 35 vehicles, a one-way loading/unloading drive, and outdoor seating for overflow waiting. Fees might be charged for using the parking area to offset terminal costs and prevent the lot from being filled up with long-term parkers. Off-airport parking lots might fill the need or the on-airport shuttle route might expand to provide access to ANC's terminal parking lots if demand exceeds parking capacity.

Alternative B includes 11 restroom facilities of permanent construction distributed around the Lake Hood complex. Each building would include men's and women's restrooms and a pay phone. The two existing pilot planning shacks would be replaced with larger, more permanent buildings, each approximately 500 square feet in area. A new 500 square foot pilot planning building would be built near Echo Parking.

Land west of the ADOT&PF office building would be reserved for an air traffic control tower, which would be needed for Lake Hood air traffic control if the ANC tower is relocated to the west side of the ANC airfield in the future.

Lake Hood access control would require a full perimeter chain link fence with approximately 12 card-activated gates. Property (4.7 acres) would need to be acquired at the east and west ends of Spenard Lake to secure the lake perimeter. The acquired land on the west side is a portion of Lakeshore Drive that will no longer be accessible to unauthorized people. The acquired land on the east side has five float slips and three private residences.

The perimeter fence would create the need for a new internal access road at the northeast end of Spenard Lake. A new internal access road, parallel to Wisconsin Avenue, would also be needed from the point where Lakeshore Drive now intersects with Wisconsin Avenue, east to Spenard Beach.

A new road would be constructed outside the perimeter fence, connecting Rutan Place to Aviation Avenue. Rutan Place is the road just east of the ADOT&PF office building. Currently, access to and from Rutan Place on International Airport Road is limited to one direction. Most traffic leaving the ADOT&PF office building and heading east uses Aviation Drive, which parallels the south shore of Spenard Lake and intersects with Spenard Road. Alternative B would restrict access from Rutan Place to Aviation Avenue to lease/permit holders and employees of businesses within the fenced area. Without the new road, vehicles destined to the east from the ADOT&PF building, the proposed GA terminal, and the proposed special lease lot would have to travel west and north on Postmark Drive or use the loop road at the passenger terminal in order to head east on International Airport Road.

Spenard Beach and the Lions Club picnic area would be outside the perimeter fence, allowing continued public access to these recreational areas. The Lions Club picnic area would be accessible from the adjacent Spenard neighborhood instead of from Lakeshore Drive as it is now, since the Airport's perimeter fence would be located between Lakeshore Drive and the picnic area.

4.3 Alternative C – Slight Expansion

Alternative C includes some improvements for safety, security, and people amenities, but focuses more on increasing airfield utility, aircraft parking, and lease land. Alternative C would keep costs down by seeking FAA approval of non-standard waterlane RPZ and RVZ conditions instead of clearing these areas of buildings, using portable latrines instead of plumbed restrooms, designating upland areas instead of wetlands for lease, and using the upland areas of the Lions Club and Spenard Beach picnic areas for aircraft parking. The Airport would develop and manage 40 additional float slips and 48 tiedowns. Alternative C also provides many opportunities for private sector aviation development on the airport, including tiedowns and hangars to rent to individual airport owners. Alternative C lengthens the gravel runway by 600 feet. Alternative C restricts entry on two roads to authorized users and provides an alternate pedestrian route around the airport to reduce the conflict of pedestrians, vehicles, and aircraft on shared surfaces. Figure 4-3 shows the major improvements that would be included in Alternative C.

4.3.1 Alternative C Airside

Airfield facilities would continue to be designed for and to serve visual operations by Airport Reference Code A-I aircraft of 12,500 pounds maximum takeoff weight.

Runway 13-31 would be extended 600 feet northward, to a length of 2,800 feet. As Table 3.2 showed, 2,800 feet would accommodate 95% of small airplanes with fewer than 10 seats. To accommodate the runway lengthening, 3.5 acres of land and 14 duplexes would be acquired. When the land is acquired and the houses are removed, the approach RPZ for Runway 13 will be brought into compliance with FAA standards.

FAA approval of nonstandard waterlane conditions would be sought. The nonstandard conditions include the length of two of the three waterlanes, structures in the runway visibility zones, and occupied buildings in two approach RPZs. Vegetation on Gull Island would be kept mowed for better visibility between intersecting runways. The NW Waterlane approach, which is seldom used, would be eliminated from use in the Alaska Supplement to the Airport Facility Directory, to avoid the need to remove occupied buildings from the RPZ.

The south end of Runway 13-31's parallel taxiway would be paved, marked, and edge-lighted, and the taxiway OFA would be cleared of aircraft parking, similar to Alternative B. However, Alternative C would not pave the gravel Lake Hood Strip apron. A partial parallel, gravel taxiway would be constructed on the northeast side of the runway, to serve the new development on that side of the runway that is proposed by this alternative.

Taxiway Victor would continue to link Lake Hood to the ANC airfield.

FAA approval for non-standard taxiway/taxilane OFAs, such as on the fingers, would be sought.

4.3.2 Alternative C Landside

Aircraft parking built and managed by the Airport would increase by 32 shoreline floatplane slips, eight spaces at a transient floatplane dock, and 48 wheeled tiedowns.

Alternative C would expand floatplane parking on existing, undeveloped land. The undeveloped land east of the ADOT&PF office building would be converted to floatplane slips. A net gain of 20 slips is possible with the formation of interlocking fingers of land and water at this site. Twelve new shoreline slips would be added at Spenard Beach. Additional parking for eight floatplanes would be at a floating dock east of Spenard Beach. The dock would be for transient aircraft and provide a place for fuel sales, if a vendor is interested in providing this service.

The Lions Club International picnic area would be converted to 12 tiedowns. Echo Parking would expand northeastward to provide 50 tiedowns on approximately 170,000 square feet of new apron. Fourteen tiedowns in the gravel Lake Hood Strip Parking would be removed from the taxiway OFA, with the paving of the south end of the parallel taxiway.

Alternative C includes a large amount of land designated for leasing by aviation related businesses or individual aircraft owners to develop facilities such as a Fixed Base Operator (FBO), an air taxi business, an aircraft maintenance business, hangars, or aircraft tiedowns. Alternative C provides three areas for lease:

Land (5.1 acres) along Aircraft Drive east of Echo Parking would be available for subdivision into lots of similar size to those southwest of this site. The land has separate taxiway and road access along the north and south sides, but lot depth is limited to 250 feet.

A 14-acre parcel would be available for lease southwest of Echo Parking. A single development or several large lots might be developed here. However, aircraft would have to taxi across the road east of the property to reach Runway 13-31.

Undeveloped land northeast of Runway 13-31 would provide 16.3 acres for development, but would depend on the construction of the partial parallel taxiway northeast of the runway and the construction of an access road along the east side of the site to be viable.

Table 3.9 projected the need for 19 acres for FBO, business expansions, new businesses, fueling, and an aviation museum by 2023. Deducting 19 acres from the 35 acres available for lease in Alternative C leaves 16 acres that might be privately developed for aircraft parking and storage. The approximate capacity of 16 acres used for tiedowns and hangars would be 130 aircraft. Combined with the 88 additional Airport-managed slips and tiedowns, Alternative C

could provide 218 aircraft spaces, slightly more than the need for 193 projected for 2023, excluding the wait list demand. However, private entities may not want to develop tiedowns or hangars to rent to individual aircraft owners. The land designated for leasing could be developed to meet market demand however the tenant desires, as long as the proposed development meets all current regulations and would not render adjacent land unusable.

Alternative C would not rely heavily on fencing to reduce nonaviation-related public access to Lake Hood. Instead, the ability to travel through the airport would be restricted. Gates on the north and east side of Lake Hood would be closed and operated by key pad, with the code provided to authorized users. Customers of Lake Hood air taxis could be provided the code so that they could drive to and from the air taxi business. Alternative C would also provide pedestrians with an alternative route to traveling through Lake Hood by adding a trail from west of Spenard Beach up to Northern Lights Boulevard near Earthquake Park, where the Tony Knowles trail is accessible. Existing fencing along the northeast property line would need to be relocated so that the trail is on airport property but outside the airport's perimeter fence. The 1.5-acre portion of Lakeshore Drive on the west side of Spenard Lake that is not Airport property would be acquired, since it would be restricted to authorized users.

Figure 4-3 shows the location of 11 portable latrines, five more than now, distributed around the Lake Hood complex.

No land is specifically designated for an air traffic control tower, which would be needed for Lake Hood air traffic control if the ANC tower is relocated to the west side of the ANC airfield in the future. The FAA may choose to build the tower on the land west of the ADOT&PF office building that is now reserved for the FAA or might select a site on land designated for lease development.

A road would be built on the northwest side of Echo Parking, in addition to the road needed east of the land proposed for private development northeast of Runway 13-31. Another road improvement included in Alternative C is the relocation of a portion of Aircraft Drive around the north end of the extended Runway 13-31, to prevent vehicles on the road from penetrating the runway's approach surface.

Although the shoreline of Spenard Beach would be developed for float slips, the remainder of the land managed by the Municipality of Anchorage as Spenard Beach would be reserved for picnicking, recreation, and for the public to view floatplane operations. Amenities such as food carts and information kiosks might be developed at this location for the benefit of visitors to Spenard Beach and for users of the adjacent transient floatplane dock.

4.4 Alternative D – More Expansion

Alternative D provides the most ambitious Airport-sponsored development. D is the only alternative that adds a paved runway. The new runway would be built along the same alignment as ANC's Runway 14-32, north of the Post Office. A new gravel runway would be built next to the paved runway and the existing gravel runway would be converted to aircraft parking. Alternative D meets the 20-year projected need for aircraft parking (excluding the wait list) with Airport-sponsored slips, tiedowns, and hangars. Alternative D also provides many opportunities for private sector aviation development on the airport, including enough land for developing tiedowns or hangars to meet the wait list demand. Most of the Lake Hood complex would be closed off from public access. Figure 4-4 shows the major improvements that would be included in Alternative D.

4.4.1 Alternative D Airside

Airfield facilities would continue to be designed for and to serve visual operations by Airport Reference Code A-I aircraft of 12,500 pounds maximum takeoff weight.

The new runway oriented parallel to ANC's Runway 14-32 would be built as close to Postmark Drive as possible without the buildings located on the east side of Postmark Drive penetrating the 7:1 transitional surface. The new runway would be paved, 3,500 feet long and 60 feet wide, with visual markings, medium intensity runway edge lights (MIRL), runway end identification light system (REILS), vertical glide slope indicator system, and lighted windsocks. The 3,500-foot runway would be longer than what is needed to accommodate 100% of small airplanes with fewer than 10 seats (3,320 feet), but shorter than the 3,840 feet required to accommodate 100% of small aircraft with more than 10 seats. The runway could be extended 500 feet more, to 4,000 feet, if two Field Maintenance Complex buildings south of the runway were removed. However, the Airport has insufficient warm storage building area for maintenance equipment according to FAA guidance now, and would require replacement buildings if the two buildings were removed.

A new 2,000 foot long by 60 foot wide gravel runway with edge lights and threshold markers would be located parallel to and just east of the paved runway. Appropriate signage would be provided for the runways and taxiways serving them.

There would be a small amount of separation between runways to help keep gravel off the paved surface, with the shoulders of the two runways abutting. The two runways could not be used simultaneously, being less than 700 feet apart. The north RPZs for the two new runways would extend off airport property onto parkland, the portion of Earthquake Park south of Northern Lights Boulevard. Easements for these RPZ areas should be acquired to ensure land use compatibility. Some fencing would also be off-airport and require an easement or agreement from the landowner, the Municipality of Anchorage. The fence must be far enough

from the runway so that it is not an obstruction. The amount of parkland needing easement acquisition for the RPZ and fence would be 2.8 acres.

Waterlane safety enhancements would be the same as in Alternative B. Alternative D would bring the runway visibility zone into compliance with the removal of four buildings at the tip of the Commercial Finger, four buildings east of the South Pothole, and Gull Island vegetation higher than 5 feet above the water surface. Three occupied buildings would be removed from the Waterlane SE and Waterlane E approach RPZs to comply with FAA standards. The NW Waterlane approach would be eliminated from use in the Alaska Supplement to the Airport Facility Directory, to avoid the need to remove occupied buildings from the RPZ. A public ramp would be added at the South Pothole to facilitate the safe launch and recovery of floatplanes when there is a strong south wind. Waterlanes NW-SE and N-S would be marked and floodlit from the shore. A bank stabilization project would correct erosion around the shorelines of Lakes Hood and Spenard. FAA approval of the nonstandard length of the NW-SE and N-S waterlanes would be sought. Both waterlanes are less than the required 2,512 feet and less than 80 percent of the E-W waterlane length; however, the two waterlanes appear to provide adequate length for the using floatplanes.

Alternative D includes major new taxiways and taxiway improvements:

- The new runways would have a partial parallel taxiway on the east side. (A full-length parallel taxiway would extend off airport property and require fill in off-airport parkland.) The taxiway would be paved, marked, and have medium intensity edge lighting.

- The new runway's parallel taxiway would extend south to connect to the Lakeshore Drive taxilane for access to Taxiway V and the ANC airfield.

- A pair of parallel taxilanes would extend east from the new runways. Pairing parallel taxiways would allow two-way taxiing. The taxiways would be separated by 69 feet between centerlines and would extend east along the edge of Echo Parking and then turn south along the east edge of the current gravel runway safety area. The new taxiway route would be used exclusively by aircraft and would not be crossed by a road from the intersection with Postmark Drive to the intersection with Lakeshore Drive north of Finger 3. The new taxiways would be paved, marked, and have medium intensity edge lighting.

- Two sets of dual taxilanes, with centerline separation of 64 feet between the dual taxilanes, would extend northeast from where the gravel runway is now. These taxilanes would facilitate the development of individual hangars and rows of hangars on new lease land.

- A taxiway/taxilane study would be conducted to determine detailed taxiway and taxilane needs. Probable recommendations of the study are that taxiways should be given letter designations according to FAA guidance, taxiways and taxilanes should be marked and provided directional signs, and taxilane OFA improvements should be made. Gravel-surfaced road/taxilane surfaces should be paved so that they can be marked clearly. The shared road/taxilane surfaces do not provide the 79-foot OFA required for an Airplane Design Group I taxilane, particularly at the fingers. The Airport would seek FAA approval of a modification of the standard, remove structures from the OFA, and/or set wingspan limits for aircraft based on the finger, based upon the clearance available and the wingspans of aircraft based on each finger.

4.4.2 Alternative D Landside

Aircraft parking built and managed by the Airport would increase by a total of 190 spaces, including 60 more slips, 120 more tiedowns, and 10 hangars.

Fingers 1 through 4 would be extended 200 feet northward to add 64 new slips. (Four slips would be lost to the South Ramp development.) Lakeshore Drive would be moved northward to accommodate the slip expansion.

The existing runway would be converted into an aircraft parking apron after construction of the new gravel runway. Echo Parking would be expanded southwest 400 feet and expanded northeast to the current gravel runway. The gravel runway, taxiway, safety area, and Lake Hood Strip Parking would be converted to paved aircraft parking, contiguous to the expanded Echo Parking. An L-shaped apron would be formed, approximately 1.2 million square feet in area, and with a capacity of 346 tiedowns. Ten hangars would be built at the southwest side of the existing Lake Hood Strip Parking, accessible by a taxilane on the tiedown apron. Charlie Parking (30 tiedowns) would be converted from GA parking to another use, such as airfield maintenance, after replacement parking is built. Alpha, Bravo, and Delta Parking areas would be retained for GA use. Alpha and Bravo are now mostly occupied by wheeled aircraft that use ANC; these areas would likely also be used for dryland floatplane parking, because of their close proximity to public ramps. Demand for wheeled tiedown spaces near Taxiway V should decrease somewhat because the amount of aircraft traffic between Lake Hood and ANC will decline after the addition of a 3,500-foot-long paved runway to Lake Hood.

Alternative D includes a large amount of land designated for leasing by aviation related businesses or individual aircraft owners to develop facilities such as a Fixed Base Operator (FBO), an air taxi business, an aircraft maintenance business, hangars, or aircraft tiedowns. Alternative D provides a total of 41.9 acres in four areas for lease:

- 6.1 acres along Aircraft Drive east of Echo Parking
- 3.1 acres southwest of Echo Parking and northeast of the Field Maintenance Complex
- 24.0 acres northeast of the existing gravel Runway 13-31
- 8.7 acres along Postmark Drive, west of the new runways

This amount of lease land is sufficient for providing FBOs, business expansions, new businesses, and enough aircraft tiedowns and/or hangars to meet the 205 aircraft wait list demand not met by Alternative D's Airport-funded development. As long as proposed development meets all current regulations and would not render adjacent land unusable, the land designated for leasing could be developed to meet market demand however the tenant desires.

A 7.4-acre site would be reserved east of the ADOT&PF office building, along International Airport Road, to lease to a single entity for a special development, in addition to the lease land described above. This lot would be for an aviation-compatible use that would generate revenue for Lake Hood, would not need taxiway access, and would need the easy and direct public access that the location provides.

A small GA terminal would be built just south of the Field Maintenance Complex, along Postmark Drive. Air taxi customers and others would need to wait outside the fence and be picked up by the air taxi operator or another authorized person, since access to most of Lake Hood would be restricted. The terminal building would be approximately 2,500 square feet in area and would provide waiting area for up to 50 people, restrooms, and area for pay phones, vending machines, tourist brochures, and phones connecting to individual businesses. The terminal should have parking area for about 35 vehicles, a one-way loading/unloading drive, and outdoor seating for overflow waiting. Fees might be charged for using the parking area to offset terminal costs and prevent the lot from being filled up with long-term parkers. If demand exceeds parking capacity, off-airport parking lots might fill the need or the on-airport shuttle route might expand to provide access to ANC's terminal parking lots. Commercial operators on Spenard Lake and in the new lease area along Postmark Drive near the new runways would not need to use the terminal, since the location of their leaseholds provides direct access to the public.

Approximately 2 acres north of Fingers 4 and 5 would be reserved for a future air traffic control tower, in case the ANC tower is relocated to the west side of the ANC airfield in the future. This location might provide a better view of Lake Hood landings and takeoffs than the FAA Reserve west of the ADOT&PF office building, considering the airfield configuration and air traffic pattern changes created by the new runways.

Lake Hood access control would require a perimeter chain link fence around most of the complex, with approximately five proximity card-activated gates. (This number does not include gates at individual leaseholds along Postmark Drive west of the new runways.) Through traffic by unauthorized vehicles would not be possible. Alternative D would provide pedestrians an alternative route to traveling through Lake Hood by adding a trail from west of Spenard Beach up to Northern Lights Boulevard near Earthquake Park, where the Tony Knowles trail is accessible. Existing fencing along the northeast property line would need to be relocated so that the trail is on airport property but outside the airport's perimeter fence.

Spenard Lake, where roads are not used for aircraft taxiing, would not be fenced off from public access. Spenard Beach would continue to be accessible to the public. Slips in the northeast end of Spenard Lake would be designated for transient aircraft. A campground area for transient floatplane users would be developed east of Spenard Beach. The campground would need security fencing.

Alternative D includes 11 restroom facilities of permanent construction distributed around the Lake Hood complex. Each building would include men's and women's restrooms and a pay phone. The one near the transient float slips and campground would include showers. The two existing pilot planning shacks would be replaced with larger, more permanent buildings, each approximately 500 square feet in area. A new 500 square foot pilot planning building would be built near Echo Parking.

Road improvements in Alternative D would facilitate development of float slips and lease land and would provide more separation of vehicles and taxiing aircraft. Lakeshore Drive north of Fingers 1 through 4 would move 200 feet farther north. A new road would be built from Lakeshore Drive northeast of Finger 4, extend north along the perimeter of the airport, and connect with existing Aircraft Drive near Jones Lake. A new road would extend southwest of this road to provide access to new lease lots. Underground power, telephone, water, and sewer lines would be extended along the new roads to serve the new lease lots.

Portions of existing Aircraft Drive would be closed for the expansion of aircraft parking and lease land near Echo Parking. Only official Airport vehicles would be allowed to cross the new, dual parallel taxiways that would be built on the northwest edge of Echo Parking and the apron expansions on either side of Echo Parking. A service road for Airport vehicles to access the snow dump would be built from Aircraft Drive, north of Echo Parking.

4.5 Evaluation of Lake Hood Alternatives

Table 4.1 summarizes the key features of the four alternatives. The capital costs of improvements were based on rough order-of-magnitude estimates in 2005 dollars.

Table 4.1
Comparative Features of Lake Hood Alternatives

Feature	Alternative A	Alternative B	Alternative C	Alternative D
Runway(s)	Existing 2,200' gravel	Lengthen existing gravel runway & use declared distances	Extend existing gravel runway 600'	New 3,500' paved runway and new 2,000' gravel runway
Taxiway Connection to ANC	Existing Taxiway V	Existing Taxiway V	Existing Taxiway V	Existing Taxiway V
Additional Airport-Provided Aircraft Parking*	0	0	88	190
Slips	*0*	*-15*	*+40*	*+60*
Tiedowns	*0*	*+15*	*+48*	*+120*
Hangars	*0*	*0*	*0*	*+10*
Additional Lease Land	None	5.7 acres	35.4 acres	49.3 acres
Capital Cost of Improvements**	$0	$31.1 million	$33.8 million	$82.8 million
Land Acquisition	None	4.71 acres (+1.31 acres for Option B1)	5 acres	1.47 acres (+2.81 acres RPZ/fence easement in parkland)
Fencing	Fencing primarily for wildlife control, no gates that are always locked	Full perimeter fencing; authorized access only	Northeast side	All but Spenard Lake
Waterlane RPZs and RVZs	Do not comply with FAA standards	Bring into compliance with FAA standards	Seek FAA-approved modification of standards	Bring into compliance with FAA standards
Gravel strip's north RPZ	Residences in RPZ do not comply with FAA standard	Move runway to avoid residences; Option B-1 does not move runway but acquires 7 duplexes	Acquire 14 duplexes and extend runway to the north	Relocate runway
Land East of DOT office bldg	No change	Special lease lot	Floatplane slips	Special lease lot

Table 4.1
Comparative Features of Lake Hood Alternatives (cont.)

Feature	Alternative A	Alternative B	Alternative C	Alternative D
GA Terminal	None	East of DOT office building	None	West of Lake Hood
Spenard Beach	No change	Continued public access; footprint limited to original land conveyance from MOA	Develop slips on shoreline; public recreation access behind slips	No change from existing
Lions Club Picnic Area	No change	Public access continued but not from Lakeshore Drive	Converted to aircraft tiedown apron	No longer accessible by general public.
Trail from Spenard Beach to Earthquake Park on northeast side of airport	Road access is available; no separation for pedestrians/bicyclists	Access through airport eliminated	New trail on airport property but outside airport perimeter fence	New trail on airport property but outside airport perimeter fence

* The Airport now manages 732 aircraft parking spaces (349 floatplane slips and 383 tiedowns). Leased land has parking and storage capacity for 340 more aircraft (80 float slips, 155 tiedowns, and 105 hangar spaces). Consequently, the total current capacity at Lake Hood is 1,072 aircraft. The unconstrained future demand projected for 2023 is 398 additional aircraft spaces, including 75% of current wait lists. Nearly half the demand is for float slips. Excluding the wait lists, demand is for 193 more aircraft spaces.
**Costs of privately developed improvements not included. All costs are in current (not escalated) dollars and are based on full build-out of the alternatives.

In the following sections, the evaluation of the alternatives is presented using the goals and objectives established in Chapter One. Additional evaluation of the alternatives is presented in the Initial Environmental Analysis, Section 4.7.

4.5.1 Safety Enhancement

Table 4.2 presents the evaluation of the four Lake Hood alternatives for meeting the goal to develop the Airport in a manner that enhances safety.

Table 4.2
Safety Enhancement Evaluation

Goal: Develop the Airport in a manner that enhances safety.

Objective	Alternative A	Alternative B	Alternative C	Alternative D
Comply with FAA design standards and Part 77 of the Federal Aviation Regulations in the development of airport facilities.	All existing airport design deficiencies remain.	Off- and on-airport RPZs, waterlane RVZ, and all taxiway OFAs brought into compliance. Approval of nonstandard waterlane lengths sought from FAA.	Off-airport RPZ and parallel taxiway OFA brought into compliance. Approval of other nonstandard conditions sought from FAA.	Off- and on-airport RPZs, waterlane RVZ, and all taxiway OFAs brought into compliance. Approval of nonstandard waterlane lengths sought from FAA.
Reduce potential conflicts between taxiing aircraft and vehicles, pedestrians, joggers, swimmers, and pets.	No improvement of conflict potential.	All traffic not authorized to enter Lake Hood complex kept away from aircraft areas by fencing and electronic gate control.	Access to Lakeshore Dr. from Wisconsin Ave. & to Aircraft Drive from Northern Lights Blvd. controlled by fencing and electronic gate control.	All unauthorized traffic kept away from areas where aircraft taxi (around Lake Hood, but not around Spenard Lake) by fencing and electronic gate control.
Reduce the potential for runway incursions, bird strikes, and FOD (foreign object damage)	No improvement for runway incursions, bird strikes, and FOD.	Access control would reduce a source of runway incursions. Parallel taxiway paving would reduce FOD at Runway 13-31. No change from existing regarding bird strike potential.	Access control would reduce a source of runway incursions. Parallel taxiway would be paved but new gravel parallel taxiway may not change FOD potential. No change from existing regarding bird strike potential.	Access control and improved separation of taxilanes and roads would reduce runway incursions. Parallel taxiway and apron paving would reduce FOD. New runway location may have greater bird strike potential due to location closer to Cook Inlet.
Maintain pavements, shoreline, and gravel surfaces in good condition.	Existing conditions maintained.	Gravel taxiways and taxilanes paved. Includes lake shore stabilization.	Gravel portion of parallel taxiway paved. Other existing conditions maintained.	Gravel taxiways, taxilanes, and aprons paved. Includes lake shore stabilization.
Enhance security at the Airport in a manner appropriate for the potential threats.	No improvement of security	All aircraft in controlled access area. Gate control of GA aircraft access to ANC.	Improvement through reduction of public access at north and east.	Aircraft, except those at Spenard Lake slips, in controlled access area. Gate control of GA aircraft access to ANC.

Alternative A would not change current aircraft takeoff and landing areas or affect the current design and use of airspace. Non-standard airport design features, safety concerns, and security deficiencies would remain unfixed.

The southward extension of Runway 13-31 in Alternative B would cause a minor change in the location of thresholds and declared runway distances in order to ensure that the north RPZ would no longer extend off-airport onto a residential area. Option B1 of Alternative B would also bring the north RPZ into compliance with FAA standards, but there would be no change in the use of Runway 13-31 from the existing. Alternative B would greatly enhance safety at the waterlanes by clearing RPZs and RVZs. Full perimeter fencing to keep unauthorized members of the public out of the Lake Hood complex would greatly enhance safety and security.

Alternative C would extend Runway 13-31, which would reduce the circumstances when GA aircraft use the ANC airfield. The runway length would be adequate for almost any Lake Hood GA aircraft takeoff, and only those aircraft operators wanting a cleared, paved surface, a crosswind runway, or an instrument approach would use ANC. Reducing the amount of light aircraft traffic at ANC would slightly enhance ANC's airfield capacity with no adverse affect on the capacity of Runway 13-31. In the past there have been concerns expressed by pilots about having to cross the Cook Inlet at low altitudes; moving the runway farther north would result in some departures being lower over the water. Safety at the waterlanes would not be enhanced as with Alternative B, since the RPZs and RVZs would not be cleared. Safety and security concerns around aircraft would be lessened compared to Alternative A because the north and east gates would reduce through traffic by vehicles and pedestrians. However, Alternative C would not include fencing to prevent vehicles and pedestrians from entering the Lake Hood complex from other directions.

Alternative D would improve aircraft safety and security by preventing unauthorized public access to all areas where wheeled aircraft taxi, takeoff, and land. Alternative D would include a new paved runway with adjacent gravel runway at a new location. The new runways would be near the boundary between the Class C airspace of ANC and the Class D airspace of LHD, which is along a 350 degree heading from the air traffic control tower. Pilots using the new GA runway could stray from Class D to Class C airspace more easily than they do with the current airfield arrangement. While Alternative D would enhance waterlane safety by clearing the RPZs and RVZs, the new paved/gravel runway location would create new potential conflicts with waterlane traffic. The new arrangement of takeoff and landing surfaces would create several conflict points for the air traffic controller that would increase complexity and the opportunity for incidents. Conflict points would be aircraft departing the lake overflying the runway and eastbound departures passing through inbound traffic from the north. The controller would need to perform more sequencing of lake and runway arrivals with lake and runway departures. The end result may be reduced airspace capacity during peak activity times. Moving the runway farther north than the other alternatives would result in departures being lower over the Cook Inlet, a concern that has been expressed by pilots in the past.

4.5.2 Fiscal Responsibility

The rough order-of-magnitude capital improvement costs for the three development alternatives are as follows:

Alternative A:	$0
Alternative B:	$31.1 million
Alternative C:	$33.8 million
Alternative D:	$82.8 million

As expected, Alternative D would be the most costly to implement, followed by Alternatives C, B, and A. Lake Hood Seaplane Base has been receiving Airport Improvement Program (AIP) passenger entitlement funding of approximately $1,000,000 per year, based on its status as a primary commercial service airport (one that has at least 10,000 annual passenger boardings on scheduled air service). Lake Hood Seaplane Base may not qualify as a primary airport if the scheduled service goes away or if the minimum number of annual passenger boardings is not met. The AIP entitlement would fall to $150,000 per year in that event.

Potential revenue for the Airport would be the highest with Alternative D because it has the most land designated for lease, the most tiedowns and slips, and the only alternative with hangars built by the Airport. On the other hand, Alternative D would be the most costly for additional maintenance, roughly estimated at $2.1 million annually.[1] Alternative C would have the next highest revenue potential for the Airport, and the next most costly expenses incurred for additional airport maintenance ($564,000 annually). Alternative B's major opportunity for increasing revenue would be the special lease lot east of the ADOT&PF office building on International Airport Road. While Alternative B would provide the same number of aircraft parking places as now exist, 15 float slips, which rent for $105 per month, would be replaced by tiedowns, which rent for $40 - $80 per month. Aside from the special lease lot, new lease area would replace lease area that is now within waterlane RPZs or RVZs. The annual increase in maintenance costs for Alternative B would be $218,000. Alternative A (No Action) includes maintaining the Lake Hood complex in its current condition; without capital improvements such as bank stabilization, the annual cost of maintenance is likely to increase.

[1] $1.38 per square foot of additional runway, taxiway, and apron. This number was derived from the Airport's recent estimate of $200,000 additional maintenance cost per year for the 145,000 square foot South Airpark Taxiway (South Airport Taxiway (West) Environmental Checklist, January 6, 2005). Not all of the airfield surfaces in the GA Plan alternatives will receive the same level of maintenance as the new South Airpark Taxiway; for example, snow will not be removed from the portions of apron where aircraft are parked. On the other hand, the Lake Hood alternatives include roads, buildings, utility systems, etc. that require maintenance, which will not be

Table 4.3 presents the evaluation of the alternatives regarding the goal to develop the Airport in a fiscally responsible manner.

Table 4.3
Fiscal Responsibility Evaluation

Goal: Develop the Airport in a fiscally responsible manner.

Objective	Alternative A	Alternative B	Alternative C	Alternative D
Increase opportunities for revenue generation at the Airport.	No increase in opportunities for revenue generation.	5.7-acre special lease lot with revenue generating potential designated. (Other new lease areas replace area lost to RPZ and RVZ clearance.) Replaces higher revenue slips with tiedowns.	35.4 acres of lease area designated. Road and taxilane access improvements facilitate development on lease land. Adds revenue from 88 additional aircraft parking spaces.	49.3 acres of lease area designated. Road and taxilane access improvements facilitate development on lease land. Adds revenue from 190 additional aircraft parking spaces.
Plan Airport development that is financially feasible to implement. Consider project funding eligibility and the ability to phase improvements to meet funding availability.	No problems with financial feasibility because no capital Improvements.	Most improvements eligible for AIP,		

4.5.3 Meeting User Needs

Table 4.4 presents the evaluation of the Lake Hood alternatives for the goal to meet the needs of all Airport users.

Table 4.4
Meeting User Needs Evaluation

Goal: Meet the needs of all Airport users.

Objective	Alternative A	Alternative B	Alternative C	Alternative D
Balance the capacity provided with the demand projected for all types of users.	No change from existing aircraft parking distribution. Deficiencies evident by wait lists for both wheeled and float-equipped aircraft parking. Transient parking thought to be deficient by some TAC members	No change in total number of aircraft parking spaces provided although number of float slips, for which demand is greatest, decreases.	Provides 40 more float slips and 48 more tiedowns, proportions similar to float/wheeled aircraft parking demand. Only alternative that provides transient float dock, which facilitates visitor use and fuel sales. Additional float slips provide additional opportunities for commercial floatplane operators.	Provides the most capacity. Provides 60 more slips and 120 more tiedowns. Additional float slips provide additional opportunities for commercial floatplane operators. Only alternative with camping area for visitors. Only alternative with Airport-owned hangars (10).
Adequately accommodate privately developed support facilities and services.	No change from existing. Requests to lease land indicate growing demand.	Special lease lot is reserved for a single leaseholder needing a large amount of land. Lease land with coveted shoreline access is replaced with land lacking shoreline.	Large amount of land with taxilane and road access is designated for lease.	Large amount of land with taxilane and road access is designated for lease. Special lease lot is reserved for a single leaseholder needing a large amount of land.
Maintain taxiway access to the ANC runways.	Taxiway V continues to provide access to ANC runways.	Taxiway V continues to provide access to ANC runways.	Taxiway V continues to provide access to ANC runways.	Taxiway V continues to provide access to ANC runways.

4.5.4 Community Asset

The general aviation infrastructure at Lake Hood is an asset for more than the pilots, passengers, business owners, and employees who are the primary users of the Lake Hood complex. In addition to direct economic impacts (payroll for those that work in the general aviation industry), there are indirect impacts such as visitor spending in the community, and

induced impacts resulting from the recirculation of direct and indirect impacts within the local economy.

The goal, “Develop the Airport so that it is an asset to the greater Anchorage community” refers to non-economic impacts on the Anchorage community. The first objective supporting the goal is, “Preserve and enhance compatible community use of Airport property.” Pedestrian and vehicular traffic, particularly traffic unrelated to aircraft or airport operations, is not a compatible use of aircraft operating areas. However, recreational uses of the Lake Hood complex, including watching floatplanes, picnicking and playing at the Spenard Beach and Lions Club areas, and walking/jogging through the area, are valued ways that Anchorage residents and visitors use Lake Hood.

The second objective under the goal is “Develop the Airport in a way that prevents or mitigates negative impact on the neighboring community and natural environment.” For the most part, the evaluation of how the neighboring community and natural environment are affected is contained in Section 4.7 of this chapter, Initial Environmental Analysis.

Table 4.5 presents the evaluation of the alternatives regarding the goal for Lake Hood to be an asset to the greater Anchorage community.

Table 4.5
Community Asset Evaluation

Goal: Develop the Airport so that it is an asset to the greater Anchorage community.

Objective	Alternative A	Alternative B	Alternative C	Alternative D	
Preserve and enhance compatible community use of Airport property.	No change from existing. Spenard Beach and Lions Club picnic area available to public. Public discouraged from aircraft operating areas, but no access control.	Public access to Lions Club picnic area and Spenard Beach preserved. GA terminal a new community asset. GA terminal provides good place for floatplane viewing.	Trail added for accessl	4	2

FIGURE 4-5
SOUTH AIRPARK GA DEVELOPMENT

4.7 Initial Environmental Analysis

The primary purpose of the initial environmental analysis is to assist with selection of the preferred alternative by identifying potential environmental issues and impacts associated with GA Plan alternatives. This preliminary analysis addresses the environmental impact categories typically evaluated for a federally-sponsored Environmental Assessment, with site-specific considerations. An in-depth analysis of potential environmental impacts and mitigation options will be conducted for environmental documentation of projects implemented under the preferred alternative. Guidance for this initial environmental analysis was obtained from FAA Order 5050.4.A, *Airport Environmental Handbook*, and FAA Order 1050.1E, *Policies and Procedures for Considering Environmental Impacts*.

Table 4.3 summarizing potential environmental impacts is included at the end of Section 4.7.

4.7.1 Air Quality

Alternatives C & D increase GA aircraft parking capacity and may result in increased emissions from fuel-burning aviation equipment and local traffic. Alternatives A and B do not expand aircraft parking, but may also result in increased air traffic over time, with increased emissions from aircraft and traffic. Improvements in fuel efficiency and emission controls may offset the

additional emissions. Temporary degradation of local air quality may also result from winter construction activities, as discussed in Section 4.7.4.

Future analysis of the proposed alternative should quantify reasonably foreseeable direct and indirect emissions and develop mitigation or plan changes to maintain compliance with the National Ambient Air Quality Standards (NAAQS), if needed. Anchorage is in Maintenance status for carbon monoxide (CO). A General Conformity Determination pursuant to the Clean Air Act Amendments of 1990 and Alaska regulations (18 AAC 50.725) may be required to evaluate potential impacts from construction and operation activities. Interagency consultation may assist in determining the need for, and parameters of, an analysis of conformity with the State Implementation Plan and the Municipality of Anchorage emission budget.

4.7.2 Coastal Resources

Much of the project area is within the coastal zone boundary, as shown on Figure 4-6, Potential Environmental Constraints. A Consistency review will be required for all action alternatives to ensure consistency with the Anchorage Coastal Management Plan. There are no barrier resources as defined in the Coastal Barriers Resources Act of 1982, or coral reefs along the Alaska coast.[2]

4.7.3 Compatible Land Use

The compatibility of existing and planned land uses around airports is usually associated with the extent of airport noise exposure. However, other effects on land use (e.g., land use plans, local ordinances, zoning, air quality, safety, habitat, and visual impacts) are also considered in evaluating land use compatibility. The following discussion focuses on noise, odors, existing plans, and compatibility issues. Related impacts are also addressed in Sections 4.7.7, 4.7.11, 4.7.13, and 4.7.14.

Alternatives B, C, and D all involve changes to runway length or location that could affect future noise exposure. Alternatives C and D involve expansion and relocation of facilities to support growth and of operations, which will also affect noise exposure and impacts on land use. Noise issues are addressed by the Airport's Noise Compatibility Program that includes measures to reduce noise generated at the Airport and to mitigate impacts off airport when reasonable and practicable. Airport noise and related land use issues are described in a number of related documents including the 2002 Ted Stevens Anchorage International Airport (TSAIA) Master Plan Update; the 1999 AIA FAR Part 150 Update, Final Noise Compatibility Program; the 2002 ANC Comprehensive Ground Noise Study Final Report; the 2000 TSAIA Wetlands Permit Application Noise Assessment; the Residential Sound Insulation Program (RSIP); and

[2] http://www.fws.gov/cep/cbrunits.html; http://wwww.coralreef.gov

Anchorage 2020 - Anchorage Bowl Comprehensive Plan; and will be addressed in the West Anchorage District Plan (planned for 2006).

There have been complaints about odors and possible air pollution in parklands and neighborhoods adjacent to the Airport, most commonly in winter. A 2003 TSAIA Air Toxics Monitoring Study conducted by the MOA Environmental Services Division, was unable to establish a link between analytical results of field air quality testing and odor complaints. In a number of cases, motor vehicle activity occurring during winter months (e.g., warming cars and intersection traffic) appeared to be the source of reportable results. This issue may be further addressed during future environmental analysis of projects under the preferred alternative.

The Anchorage 2020 Comprehensive Plan recognizes a zone of airport impact on land use, including noise, traffic, and air quality. Future airport development is addressed, including potential impact on adjacent neighborhoods (e.g., loss of natural buffers, open space, and recreation). A primary goal of the new West Anchorage District Plan will be resolution of impacts to neighborhoods, public infrastructure, and the environment from Airport activities. Title 21 of the Anchorage Municipal Code is also under revision to include building standards that could provide more neighborhood protection.

The increase in area lease lots proposed by Alternatives C and D may increase the number of small businesses in the GA area. Alternatives C and D propose development of lease lots in a presently undeveloped area northeast of Lake Hood, which may alter the character of the adjacent neighborhood and change the nature of impacts associated with the alternatives (e.g., noise, lights). Changes in the existing bike/foot trail may also affect local land use.

Increased traffic and fencing proposed in all action alternatives may impact access and local traffic flow. Fencing proposed for Alternatives B, C, and D to improve safety and security by restricting existing vehicular through-traffic.

Fencing proposed in Alternative B restricts public access to wetland areas and reduces public access to walk along the lakeshore. Fencing proposed in Alternative D eliminates general public access to wetland areas. In Alternative C, public access to wetland areas is eliminated from the north and east. However, the trail proposed along the fence-line in Alternatives C and D provides for additional public trail access to the Coastal Trail.

Any effects on the Anchorage Metropolitan Area Transportation Solutions Long Range Transportation Plan (AMATS LRTP) should be considered during future environmental analysis of specific projects. Under AMATS, the surface transportation network in the vicinity of the Airport is considered to be fully built-out. The current Municipal Capital Improvement Program identifies improvement projects in the area including Strawberry Road and West Northern Lights

Boulevard. However, Alternative D prohibits the future construction of Logistics Drive, which was included in the ANC Master Plan.

Concern for safety suggests that activities like jogging and swimming are incompatible with operating aircraft. The Airport has posted signs and issued operational bulletins restricting vehicular and pedestrian access on surfaces where an alternative route is available (west side of Lake Hood) and stating that aircraft have priority, that vehicles/pedestrians shall always yield to aircraft, and that pedestrians must stay clear of the road/taxiway surfaces. Signage is the only means of enforcing these safety precautions at the present. At the April 7, 2004 meeting of the Technical Advisory Committee (TAC), pilot concern about pedestrian failure to recognize aircraft taxiing when exercising on the trail or swimming at Spenard Beach was identified. On October 30, 2004, one floatplane pilot submitted a long letter to the Airport describing the specific hazards of swimmers and floatplane operations. It was also noted that water quality and poor MOA enforcement of swimming restrictions at Spenard Beach are both community and aviation concerns. Related land use compatibility issues should be addressed in future environmental analyses of projects proposed under the preferred alternative.

Lake Hood and associated GA facilities are located in a known geophysical hazard area, designated as having moderate to high susceptibility to seismic ground failure, which may be an environmental consideration for future assessments of proposed land use and project design.

4.7.4 Construction Impacts

Construction may impact operations, water quality, air quality, noise, and biological resources. Operational impacts to the airport may occur during construction of some proposed improvements (e.g., runway extension). Temporary vehicle and aircraft traffic delays and detours may occur during demolition and/or construction activities proposed in Alternatives B, C, and D, but are expected to be minimal or mitigated. Haul roads, staging and stockpiling of construction materials will planned for future projects to minimize or prevent impacts. FAA Advisory Circular 150/5370-10A, *Standards for Specifying Construction of Airports*, provides direction to reduce airport-related construction impacts. It is expected that a construction plan will be required, with activities scheduled to minimize impacts. If proper procedures are followed, construction impacts are expected to be short term and minor.

Alternatives B, C, and D involve shoreline and/or near-shore work; Alternatives C and D will require excavation and dredging in Lake Hood. Bank stabilization projects are proposed for Alternatives B and D. Temporary degradation of water quality will be addressed by regulatory agencies and permitting requirements for all alternatives. Water quality impacts will be minimized by best management practices (BMPs) of a Sedimentation and Erosion Control Plan and/or Storm Water Pollution Prevention Plan (SWPPP) required by the National Pollutant Discharge Elimination System (NPDES) Storm Water General Permit for Construction.

All action alternatives require use of construction equipment with emissions that have the potential to temporarily degrade air quality. To ensure air quality conformity, the Airport, in coordination with ADEC and FAA, requires contractors to call the Air Quality Index hotline daily when conducting construction activity between November 1 and March 1. The contractor must cease construction activity if the Air Quality Index exceeds 90. Minimizing winter construction activities along with improvements in fuel efficiency and emission controls could reduce air impacts. Airborne dust may also be an issue during construction, but watering will keep dust down and levels are not expected to exceed NAAQS. Noise resulting from construction will be subject to the Municipal Noise Ordinance.

Local wildlife, waterfowl, and shorebirds may be disturbed or displaced by construction. All action alternatives involve construction activity in and around bird habitat, which is restricted under the Migratory Bird Treaty Act (e.g. minimize disturbance during nesting season). FAA Advisory No: 150/5200-33A *Hazardous Wildlife Attractants on or Near Airports* (July 2004) and the *Memorandum of Agreement between FAA, USAF, US Army, USEPA, USF&WS, and USDOA to Address Aircraft-Wildlife Strikes* should be consulted when evaluating the wildlife hazards associated with aviation development.

4.7.5 Department of Transportation Section 4(f)

Locations of parks and trails in the vicinity of the proposed alternatives are noted in Figure 4-6. The Coastal Trail, Earthquake Park, Northwest Connors Bog skijoring trails and lake, and Kincaid Park will not be affected by proposed development Alternatives B or C. Alternative D requires obtaining avigation and hazard easements from Earthquake Park for two new RPZs and relocating existing fencing. Aircraft activity would also increase in this area.

Fencing proposed in Alternative B allows public access to Airport-owned recreational lands (i.e., Lions Club picnic area and Spenard Beach), but otherwise prevents access to the lake and GA facilities. Alternatives C and D propose an alternative trail outside proposed perimeter fencing (but on airport property) that goes by Lake Hood and north to join the Tony Knowles Coastal Trail in Earthquake Park. Alternative C fencing allows public access to all areas but restricts ingress and egress to GA facilities from the residential area northeast of the site. Alternative C proposes to develop the Lions Club picnic area and Spenard Beach, preserving adjacent upland area for picnic/floatplane viewing. Alternative D fencing preserves access to Spenard Lake and Beach, but otherwise prevents access to Lake Hood and GA facilities.

Under FAA Directive 1050.1E, any program or project that requires the use of any publicly-owned 4(f) land, public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance or land from an historic site of national, state, or local significance, shall not be approved unless there is no feasible and prudent alternative, and the project includes all

possible planning to minimize harm resulting from the use. Anchorage 2020 calls for a collaborative public process associated with any decision to convert recreational area to airport development and a new West Anchorage District Plan to address neighborhood issues, including recreation, associated with the Airport.

4.7.6 Farmlands

No prime or unique farmlands as defined under the Farmland Protection Policy Act of 1981 have been designated in the State of Alaska.[3]

4.7.7 Fish, Wildlife and Plants

No species listed under the Threatened and Endangered (T&E) Species Act or their critical habitats are known to occur at the Airport. A "no-effect" determination was made by the United States Fish and Wildlife Service (USF&WS) during authorization of the 10-year Wetlands Permit.[4] When specific projects are proposed in the future, the USF&WS will be consulted to confirm that no T&E species listed at that time would be affected.

No anadromous fish streams, rivers, or lakes occur at the Airport.[5]

Eagles are protected under the Bald and Golden Eagle Protection Act. Three eagle nests are known to exist on airport property (Figure 4-6); however, no known eagle nest exists within 660-feet of the area potentially disturbed by any alternative. Alternative D may create new disturbance to existing nests, and Alternative C and D may require a survey for new eagle nesting sites outside airport property during future evaluation of the proposed alternative.

All development alternatives include fencing. Alternative B proposes to fence the entire lake perimeter except Spenard Beach. Alternatives C and D propose partial fencing. Full or partial fencing may require further research to evaluate wildlife management options.

Alternative D proposes to add two runways and a parallel taxiway in Turnagain Bog, which is prime moose and waterfowl habitat. All development alternatives support an increase in aircraft activity within wildlife habitat. Wildlife pose safety concerns for aviation operations, and any activity on airport property must be designed to avoid wildlife hazards.

150/5200-33A states that wildlife attractants must be 5,000 feet from the nearest air operations area at airports serving piston-powered aircraft. This Advisory Circular also states that when airport operators are expanding an existing airport into or near wetlands, a wildlife damage

3 http://www.ak.nrcs.usda.gov/technical/soils/ soilslocal.html

4 DOWL 2002b, p F-1

5 http://gis.sf.adfg.state.ak.us/AWC_IMS/ viewer.htm.

management biologist, in consultation with the USF&WS, Corps of Engineers (COE), and the state wildlife management agency (Alaska Department of Fish and Game and Alaska Department of Natural Resources) should evaluate wildlife hazards and prepare a Wildlife Hazard Management Plan for minimizing the hazards. The Airport has such a plan in place that might require revision based on proposed development. The Airport also has a hazing program and taking permits to avoid wildlife/aircraft conflicts.

There are no threatened or endangered plants in or near the project area. Most of the vegetation is native to Alaska, and no unique plant populations are known to exist in the project area. Where needed, disturbed land will be re-vegetated with approved seed mixes and landscaping materials that avoid potential wildlife attraction. All action alternatives include clearing vegetation over 5 feet above the lake surface within the runway visibility zone. All action alternatives include new floatplane parking areas in Lake Spenard, and it may be necessary to clear floating or emergent vegetation for aircraft safety in this area.

4.7.8 Floodplains

Portions of the project area are within the designated 100-year floodplain as defined by the Federal Emergency Management Agency (FEMA) on the Flood Insurance Rate Map (FIRM) MOA Division Panels 230 and 240, and in the Anchorage International Airport Hydrology Assessment Study (August 14, 2000 Addendum) as noted on Figure 4-6. Under FAA Order 1050.1E (Section 9.2H), if the only practicable alternative requires siting in the base floodplain, a floodplain encroachment would occur and further environmental analysis is needed. Alternatives B, C, and D propose development within the 100-year floodplain and elements of Alternative A exist within the 100-year floodplain. Future analysis should consider potential impacts of local flooding, floodplain values, floodwater storage, and storm-drain capacity for the selected alternative.

4.7.9 Hazardous Materials, Pollution Prevention, and Solid Waste

Option B1 and Alternative C propose land acquisition and demolition of presently occupied structures to clear the Runway 13 RPZ or to allow lengthening of Runway 13-31. Alternatives B and D also involve demolition of structures and occupied buildings within waterlane RPZs and RVZs. Federal or state-owned structures may require a “Hazardous Material Survey” prior to demolition and disposal of debris. The nearest public landfill is 15 miles away.

Expansion of airport facilities will result in increased vehicle and aircraft activity, resulting in increased potential for spills or mismanagement of fuel and maintenance products, sanitary waste, trash, and debris. All wastes and debris will be managed in accordance with applicable regulations. The Airport has developed a number of BMPs relating to onsite activities and waste management that should minimize the potential for related impacts. Both solid waste disposal

and sanitation facilities are available at the airport. Permanent restrooms are proposed to be located on the lake perimeter in Alternatives B and D. Latrines are proposed in Alternative C. Construction of wastewater utilities in lakeside areas will be designed to meet Anchorage Water and Wastewater Utility (AWWU) standards and Alaska Department of Environmental Conservation (ADEC) permit requirements.

Alternatives B, C, and D propose construction along or near Lakes Hood/Spenard. Excavation and dredging within the lake is also required for Alternatives C and D. Proposed work may encounter contaminated soils or water. The project area contains known and potential contaminated sites, particularly along the lake shore and near-shore area. A preliminary review indicates approximately 10 known contaminated sites are within 0.25 miles and 21 sites are within 0.5 miles of the general project area.[6] A full Phase I Environmental Site Assessment should be completed during environmental analysis of future projects to confirm the condition of affected sites. A Phase II Assessment, waste management plans, and corrective action plans may be required before working in known contaminated areas and storing or disposing of dredged materials.

4.7.10 Historical, Architectural, Archeological and Cultural Resources

There are no known eligible or potentially eligible National Register Sites listed within the current GA property boundary. A finding of "No historic properties affected" was issued by the ADNR State Historic Preservation Officer (SHPO) for the Turnagain Bog 4 permit area. The SHPO will be consulted again in the future when specific activity is proposed to ensure that property acquisition or development does not impact cultural or historical resources.

4.7.11 Light Emissions and Visual Impacts

Alternatives B and D propose to mark existing waterlanes with floodlighting. Alternatives C and D propose tiedown parking and lease lots with lighting in a presently undeveloped area adjacent to a residential neighborhood. Alternative C leaves a natural buffer between the parking/lease lot area and the residences; Alternative D does not. It is not expected that new lighting would substantially impact the community. Lighting is typically installed by requirement (e.g. navigation) or for personal safety (aircraft aprons and auto parking lots). To the extent practicable, lighting design (e.g., down-looking, hooded) and intensity (low wattage) is selected to reduce potential impacts. However, visual impacts of lighting are difficult to define due to the subjectivity involved. The extent of lighting and visual impacts will be further analyzed on a project by project basis.

4.7.12 Natural Resources and Energy

6 DOWL 2002a; DOWL 2002b Appendix I

Proposed construction and operations involve use of non-renewable resources (e.g. fuel, electricity, asphalt, gravel). It is expected that projected demands can be met by current sources, as power demand would have to exceed 10 megawatts to require upgrade of the supplier's existing capacity. Fuel demand may require further assessment to quantify effects on existing supplies. Proposed activities do not require unusual amounts or types of natural resources.

4.7.13 Noise

As described in Section 4.7.3, a number of noise analyses have been completed for the Airport. A quantitative noise analysis using FAA's Integrated Noise Model will be completed during the Noise Compatibility Program update which would include proposed activities. Modeling will assist in determining actual land use compatibility under the *Airport Noise Compatibility Planning Program.*

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4.7.14 Socioeconomic Impacts, Environmental Justice and Children's Environmental Health and Safety Risks

Option B1 involves acquisition of seven units composed of 14 private residences that are within the existing Runway 13 RPZ. Alternative C involves the acquisition of 14 units for the extension of Runway 13-31. Although relocation may be required, there appears to be sufficient replacement housing in the area. The 2000 Census reported a vacancy rate of 1.4% in owner occupied housing and a vacancy rate of 5.3% in rental units. If federal funds are used, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 applies for displacement of persons or real property required by the preferred alternative. Alternatives B and D propose to remove occupied buildings in two waterlane RPZs and in the waterlane RVZ, requiring some compensation to tenants.

Alternatives B, C, and D involve the acquisition of property along a portion of Lakeshore Drive located south of the Lions Club picnic area. Alternative B also involves acquisition of developed property along the eastern shore of Lake Spenard. Alternative D requires acquisition of a navigation/hazard easement on parkland, as well as a new easement along the northeast property line for a new fence.

Alternatives A and B retain Lions Club picnic area and Spenard Beach. Alternative C proposes to develop both, eliminating public use of those areas, except for the picnic area north of the Spenard Beach shoreline. Alternative D retains Spenard Beach but prevents public access to the Lions Club picnic area.

Analysis of demographic information from the 2000 US Census does not indicate disproportionately high or adverse impacts on minority or low income populations by any of the alternatives. Children are assumed to be primary users of Spenard Beach for swimming and

other contact recreation. This suggests that health and safety concerns about lake water quality and recreation in a lake used for aviation may disproportionably apply to children. Alternatives A, B, and D would retain beach access for swimming, but Alterative C would develop the beach front, restricting use for water recreation.

4.7.15 Water Quality

Lake Hood receives stormwater runoff from the south and east portions of the Airport and the small watershed immediately surrounding the lakes. The majority of the development proposed for Alternatives B, C, and D is north or northwest of the lakes, which generally, drains north, away from Lake Hood, into the Turnagain Bog drainage system. Neither deicing nor anti-icing compounds are used for GA aircraft. Hence, water quality degradation of Lake Hood from GA-related development in these areas is not anticipated to result if existing drainage patterns are maintained.

Alternatives B, C, and D involve some paved improvements. Paving reduces the potential for siltation, but increases the potential for water quality degradation from surface runoff. The Airport Drainage Plan will be revised as needed to avoid increased pollutant loading to Turnagain Bog due to increased development and use of GA facilities. Any variation in the lake resulting from any alternative that could affect groundwater flow in the area needs to be included in airport hydrologic assessments to avoid potential impacts to the bog and nearby developed areas.

New construction and operations associated with all action alternatives must comply with the NPDES Storm Water Construction General Permit and the AIA NPDES Stormwater Permit and the associated Erosion and Sediment Control Plan and/or SWPPP. Alternatives B and D propose the addition of a public ramp which, along with increased floatplane activity at that site, may increase shoreline erosion. Conversely, the design of the public ramp may prevent erosion better than the private slips it replaces. Bank stabilization projects proposed for Alternatives B and D should minimize related impacts on water quality.

4.7.16 Wetlands

Alternatives B, C, and D involve development of varying amounts of designated wetlands located on airport property, as shown in Table 4.6. Most development involves Type “A”, or preservation wetlands. The Anchorage Wetlands Plan specifies buffers and construction techniques to preserve the value (e.g., habitat, hydrology) of impacted Type “A “wetlands. A Corps of Engineers Section 404 permit with ADEC Section 401 water quality certification and other agency consultations will be required for development of wetlands. A Memorandum of Agreement is in place among state and federal agencies that presents a programmatic approach to meeting the mitigation hierarchy of National Environmental Policy Act, Section

404(b)(1) Guidelines, Executive Order 11990 (Protection of wetlands, as well as applicable agencies mitigation policies.

Developing wetlands reduces the area available for runoff storage and infiltration. Future environmental analysis of development under the preferred alternative will need to consider site-specific effects of filling wetlands on groundwater levels, flow directions, stormwater runoff, and potential impacts to developed areas and utilities – as well as habitat loss.

4.7.17 Wild, Scenic and Recreational Rivers

No flowing streams exist on Airport Property. There are no wild or scenic rivers on or near the project area.[7]

4.7.18 Secondary and Cumulative Impacts

Proposed improvements include future hangars and other associated aviation facilities that may support increased ground and air traffic and provide new business and economic opportunities. For example, if the selected alternative increases the capacity of general aviation to meet the demand, economic opportunities may include improved access to rural and remote areas, increased sightseeing/flightseeing opportunities, and increased support services. Cumulative fuel and energy demands resulting from this additional infrastructure should be considered in the environmental analysis of the proposed alternative to ensure that local providers (e.g., fuel) and public utilities can meet associated demands.

4.7.19 Summary

Table 4.6 summarizes potential environmental impacts that may be associated with each proposed GA Plan alternative, and require further analysis if selected for development. Not all impacts are addressed in the summary. Select key issues that help distinguish among alternatives were selected for comparative purposes in the table.

7 http://www.nps.gov/rivers/wildriverslist.html#ak

Table 4.6 Summary of Initial Environmental Analysis

IMPACT CATEGORY	Alternative A (No Action)	Alternative B	Alternative C	Alternative D
AIR QUALITY	No Conformity determination No Interagency consultation	No Conformity determination or interagency consultation expected	Conformity determination expected Interagency consultation expected	Conformity determination expected Interagency consultation expected
COASTAL RESOURCES	No Consistency Determination	Consistency Determination	Consistency Determination	Consistency Determination
COMPATIBLE LAND USE	No change in existing noise and/or odor No change in number of occupied buildings in RPZ No new land development No change in traffic patterns	Possible change in noise and/or odor issues No occupied buildings in RPZ. Option B-1 maintains existing runway configuration and acquires residential properties in the RPZ Eliminates route northwest around lake to Coastal Trail Eliminates public access via Lakeshore Drive. Fencing prohibits public access to wetlands and lakeshore walkway.	Likely change in noise and/or odor issues Acquisition of residential properties in the RPZ Reduces undeveloped land adjacent to neighborhood Eliminates ADOT&PF access via Aviation Avenue. Eliminates public access via Lakeshore Drive. Fencing prohibits public access to wetlands. Trail provides additional access to Coastal Trail.	Likely change in noise and/or odor issues No occupied buildings in RPZ. Requires avigation and hazard easement over Earthquake Park and TN Coastal Trail Eliminates most undeveloped land adjacent to neighborhood Eliminates public access via Lakeshore Drive. Fencing prohibits public access to wetlands. but improves security. Trail provides additional access to Coastal Trail
CONSTRUCTION IMPACTS	No water quality degradation. No new wildlife disturbance	Shoreline and nearshore construction, with bank stabilization; lake dredging for new slips Least amount of construction minimal wetland fill	Shoreline and nearshore construction; excavation for 20 new slips; construction of another 12 slips Intermediate amount of new construction Shoreline habitat construction for 32 new slips; wetlands fill	Shoreline and nearshore construction, with bank stabilization; excavation for 60 new slips Most new construction New runway construction in high habitat value wetlands. New tiedowns/slips in shoreline habitat.
DOT 4(f)	No effect	Preserves beach and adjacent park; prevents recreational use of shared taxiway/road surfaces	Eliminates both beach and picnic area, but leaves upland area for public use. Will need 4(f) Determination	Preserves beach and adjacent park; prevents recreational use of shared taxiway/road surfaces. Requires avigation/hazard easement for Earthquake Park and possibly Coastal Trail. Will need 4(f) Determination

Table 4.6 Summary of Initial Environmental Analysis (cont.)

IMPACT CATEGORY	Alternative A (No Action)	Alternative B	Alternative C	Alternative D
FISH, WILDLIFE, & PLANTS	No new impacts			

4.8 Preferred Alternative

The alternatives for Lake Hood presented in this chapter will be presented to the TAC, environmental agencies, and the public during meetings in March 2005. The Airport will not decide upon a concept to guide the future GA development at Lake Hood until the participants of these meetings and others have reviewed and commented on the concepts and the alternatives evaluation. The preferred alternative for Lake Hood may be one of those presented in this chapter or a concept that combines features of different alternatives and suggested improvements.